

## Resource Quality Criteria - Soil Resource

### 1. Erosion

#### (a) Sheet and Rill

Resource Concern: Excessive amounts of soil are being moved by water forces.

Criteria: The soil loss tolerance "T" for the soil or map unit component listed in Section II, FOTG is not exceeded.

#### (b) Wind

Resource Concern: Excessive amounts of soil are being moved by wind forces.

Criteria: The soil loss tolerance "T" for the soil or map unit component listed in Section II, FOTG is not exceeded.

#### (c) Concentrated Flow: Ephemeral Gully

Resource Concern: Concentrated flow channels along depressional water courses that begin where overland flow, including rills, converge. Ephemeral gullies only occur in cropland and are usually obscured by tillage operations.

Criteria: Concentrated flow channels are stabilized.

#### (d) Concentrated Flow: Classic Gully

Resource Concern: Classic gullies are channels that may grow or enlarge from year to year by headcutting and lateral widening. Classic gullies can form in all landuses. If occurring in cropland, they are too deep to be erased by normal farming operations.

Criteria: Channel bottom, headcuts, and sidewalls are stabilized.

#### (e) Streambank

Resource Concern: Sloughing of streambanks caused by overbank flow, unstable soils, obstructions, unstable channel bottom, saturated banks, riparian area losses, or any combination of these.

Criteria: Streambanks are stabilized.

#### (f) Irrigation Induced

Resource Concern: Erosion that is caused by excessive amounts and/or velocity of water in row, furrow, and sprinkler irrigation activities or by water conveyance and tracks from center pivots and traveling guns.

Criteria: Water is applied in accordance with an approved Irrigation Development Plan, using the Kansas Irrigation Guide as a development tool.

**(g) Soil Mass Movement**

**Resource Concern:** Soil slippage, landslides, or slope failure, normally on hillsides, in deep cuts or through unstable soil on sloping land, that creates a large volume of soil movement.

**Criteria:** Mass movement does not exceed natural conditions and actions taken do not contribute to the concern.

**(h) Roadbanks and Construction Sites**

**Resource Concern:** Erosion is identified as causing problems and damage, either onsite or offsite.

**Criteria:** Roadbanks and construction sites are stabilized. Overland and channel flows are conveyed safely. Scoured areas are stabilized considering flow velocity, depth, and probability of occurrence.

**(i) Safety**

**Resource Concern:** Erosion is identified as causing safety hazards, either onsite or offsite, to humans, plants, and/or animals.

**Criteria:** Erosion is reduced to a level that will no longer contribute to hazardous conditions. The plan must include measures to eliminate the hazardous condition.

**2. Condition**

**(a) Soil Tilth, Crusting, Water Infiltration, Organic Material**

**Resource Concern:** Unsuitable soil tilth. Soil tilth is the condition of the soil based on suitable combinations of mineral, air, water, and organic matter, resulting in a proper habitat in which microbial activity and chemical reactions can occur.

**Criteria:** For cropland, organic matter content and bulk density for the soil mapping unit or component are maintained within the ranges identified in the Physical and Chemical Properties table. The Physical and Chemical Properties table is located in Section II, FOTG, behind the Engineering Interpretations divider. For other landuses, soil condition must not impair the growth and vigor of the target plant species.

**(b) Soil Compaction**

**Resource Concern:** Soil compaction effects the plant-soil-moisture-air relationship of the soil. Compaction is excess compressing of soil particles and aggregates by machine, livestock, and natural consolidation.

**Criteria:** Management induced compacted zones are absent, or are present at levels that do not limit plant growth and/or water and air movement.

**(c) Soil Contaminants: Excess Chemical Content, Salinity, Selenium, Boron, Heavy Metals, or Petroleum**

*Resource Concern:* Excess chemical content, salinity, selenium, boron, heavy metals, or petroleum (including amounts of chemical elements and compounds consisting of either organic or inorganic forms) restricts the desired use of the soil.

*Criteria:* Soil contaminants are absent, or present at levels below accepted standards for the intended landuse.

**(d) Soil Contaminants: Excess Animal Wastes & Other Organics**

*Resource Concern:* Excess animal wastes and other organics restrict the desired use of the soil.

*Criteria:* Agricultural wastes and other organics are applied in accordance with an approved Waste Management Plan, using the Agricultural Waste Management Field Manual as a development tool.

**(e) Soil Contaminants: Excess Nutrients**

*Resource Concern:* Excess nutrients occur if the application of nutrients or quantity of nutrients restricts the desired use of the soil.

*Criteria:* Nutrients are applied at levels that are consistent with plant needs, based on soil tests or KSU Cooperative Extension Service recommendations.

**(f) Soil Contaminants: Excess Pesticides**

*Resource Concern:* Excess pesticides occur if the application method, type of pesticide, or residuals restrict the desired use of the soil.

*Criteria:* Soil contaminants are absent, or present at levels which do not adversely affect other resources or restrict the intended use of the land.

### **3. Deposition**

**(a) Damage: Onsite**

*Resource Concern:* Need to rework ground because of sediment thickness and distribution; crops destroyed; and/or infertile deposition, especially for coarse textured sediment.

*Criteria:* Onsite deposition does not alter plant-soil-moisture-air relationships, damage property, cause physical damage to vegetation, or limit the intended use of the land.

**(b) Damage: Offsite**

*Resource Concern:* Soil deposition occurring on the treatment unit is causing problems similar to the concerns of onsite damage to adjacent land.

Criteria: Offsite deposition does not alter plant-soil-moisture-air relationships on adjacent land, damage adjacent property, cause physical damage to vegetation on adjacent property, or limit the intended use of adjacent land.

**(c) Safety: Onsite**

Resource Concern: Deposition on roads, railroads, and utilities that cause accidents, loss of life, and loss of access for emergency vehicles.

Criteria: Onsite deposition is controlled to eliminate safety hazards.

**(d) Safety: Offsite**

Resource Concern: Deposition occurring within the treatment unit is causing safety problems similar to those listed in the concerns for onsite safety to adjacent land.

Criteria: Offsite deposition is controlled to eliminate safety hazards.

## Resource Quality Criteria - Water Resource

### 1. Quantity

#### (a) Excess Amounts: **Seeps**

Resource Concern: Excessive amounts of subsurface water flows onto the surface of the land.

Criteria: Subsurface water is managed to provide optimum use for the intended land use.

#### (b) Excess Amounts: **Runoff / Flooding**

Resource Concern: Excessive amounts of water accumulates on the surface of the land.

Criteria: Surface water is managed to provide optimum use for the intended land use.

#### (c) Excess Amounts: **Subsurface Water**

Resource Concern: Excessive amounts of subsurface water accumulates in the soil profile.

Criteria: Subsurface water is managed to provide optimum use for the intended land use.

#### (d) **Inadequate Outlets**

Resource Concern: Water conveyance channels and structures to collect and remove water from the land are unsuitable.

Criteria: Water discharges are disposed of through stable outlets of adequate capacity.

#### (e) **Water Management for Irrigated Land**

Resource Concern: Inefficient and/or untimely utilization of water supplies.

Criteria: Irrigation water is applied in accordance with an approved Irrigation Development Plan, developed using the Kansas Irrigation Guide.

#### (f) **Water Management for Non-Irrigated Land**

Resource Concern: Managing too little or too much water or managing moisture that occurs or is deficient during seasonally inappropriate times. Includes managing water yields.

Criteria: Management provides optimum use of natural moisture for the intended land use.

#### (g) **Restricted Capacity From Sediment Deposition in Small Water Conveyance: Onsite**

Resource Concern: Farm drainage ditches, road ditches, culverts, and canals within the conservation treatment unit do not have adequate capacity due to sediment deposition.

**Criteria:** Conveyances within the conservation treatment unit are maintained at an adequate flow capacity.

(h) Restricted Capacity From Sediment  
Deposition in Small Water Conveyance: **Offsite**

**Resource Concern:** Drainage ditches, road ditches, culverts, and canals on land adjacent to the conservation treatment unit do not have adequate flow capacity due to sediment deposition.

**Criteria:** The treated area does not contribute to sediment deposition in water conveyance systems on land adjacent to the conservation treatment unit.

(i) Restricted Capacity For Sediment Deposition:  
**Water Bodies, Streams, Lakes**

**Resource Concern:** Storage capacity as well as conveyance capacity is reduced because of sediment deposition in water bodies, streams, and lakes.

**Criteria:** Treated areas do not contribute to loss of storage and/or capacities that exceed designed or expected rates.

## 2. Quality

**NOTE:** *Water quality criteria has not been designated as onsite and offsite. It is recognized that all practice effects will be both onsite and offsite.*

(a) Groundwater Contaminants: **Pesticides**

**Resource Concern:** Amounts of pesticides in groundwater exceed accepted standards. Pesticides means all chemicals used to manage weeds, insects, and diseases.

**Criteria:** Application of pesticides is consistent with label instructions, KSU Cooperative Extension Service recommendations, and the Soil-Pesticide Interaction Screening Procedure (SPISP) located in Section II, FOTG behind the Water Quality and Quantity tab.

(b) Groundwater Contaminants: **Nutrients and Organics**

**Resource Concern:** Nutrient and organics amounts in groundwater exceed accepted standards. Contaminants may include the common nutrients of N, P, and K.

**Criteria:** Application of nutrients and organics is consistent with KSU Cooperative Extension Service recommendations or an approved waste management plan, developed using the Agricultural Waste Management Field Manual.

(c) Groundwater Contaminants: **Salinity**

Resource Concern: Salinity of groundwater exceeds accepted standards. Contaminants may include common elements or salts, such as sodium, calcium, boron, selenium, chlorides, and sulfates.

Criteria: Treated areas do not contribute salts at a level that adversely affects the ground water.

(d) Groundwater Contaminants: **Heavy Metals**

Resource Concern: Groundwater contains amounts of heavy metals that exceed accepted standards. Contaminants may include metal compounds, such as iron, lead, zinc, copper, and cobalt.

Criteria: Treated areas do not contribute heavy metals at a level that adversely affects the ground water.

(e) Groundwater Contaminants: **Pathogens**

Resource Concern: Amounts of pathogens in the groundwater exceed accepted standards. Contaminants may include bacteria, virus, protozans, helminths, and fungi. Pathogens can be transported in both fluid and particulate forms.

Criteria: Treated areas do not contribute pathogens at a level that adversely affects the ground water.

(g) Surface Water Contaminants (Streams and Lakes): **Pesticides**

Resource Concern: Amounts of pesticides in surface waters exceed accepted standards. Pesticides means all chemicals used to manage weeds, insects, and diseases.

Criteria: Application of pesticides is consistent with label instructions, KSU Cooperative Extension Service recommendations, and the Soil-Pesticide Interaction Screening Procedure (SPISP) located in Section II, FOTG behind the Water Quality and Quantity tab.

(h) Surface Water Contaminants (Streams and Lakes): **Nutrients and Organics**

Resource Concern: Nutrient and organics amounts in surface waters exceed accepted standards. Contaminants may include the common nutrients of N, P, and K. Biological Oxygen Demands (BOD's) which are high by water quality standards can be associated with excessive amounts of nutrients in surface water.

Criteria: Application of nutrients and organics is consistent with KSU Cooperative Extension Service recommendations or an approved waste management plan, developed using the Agricultural Waste Management Field Manual.

(i) Surface Water Contaminants (Streams and Lakes): **Suspended Sediment and Turbidity**

Resource Concern: Surface waters contain amounts of suspended sediment and turbidity that exceed accepted standards. Suspended sediment is sediment held in water. Turbidity is reduced clarity of water because of presence of suspended matter. Treatment may require a reduction of soil loss to a level well below the soil loss tolerance, "T".

Criteria: The treated area does not contribute sediment at a level that causes turbidity of surface water.

(j) Surface Water Contaminants (Streams and Lakes): **Low Dissolved Oxygen**

Resource Concern: Low amounts of dissolved oxygen are present in surface waters. Sediment and nutrients in the water may contribute to low dissolved oxygen.

Criteria: The treated area does not contribute to a reduced dissolved oxygen level in surface waters.

(k) Surface Water Contaminants (Streams and Lakes): **Salinity**

Resource Concern: Salinity of surface waters exceed accepted standards. Contaminants may include common elements or salts, such as sodium, calcium, boron, selenium, chlorides, and sulfates.

Criteria: Treated areas do not contribute salts at a level that adversely affects surface waters.

(l) Surface Water Contaminants (Streams and Lakes): **Heavy Metals**

Resource Concern: Surface waters contain amounts of heavy metals that exceed accepted standards. Contaminants may include metal compounds, such as iron, lead, zinc, copper, and cobalt.

Criteria: Treated areas do not contribute heavy metals at a level that adversely affects surface waters.

(m) Surface Water Contaminants (Streams and Lakes): **Temperature**

Resource Concern: Undesirable water temperatures are present in surface waters.

Criteria: The treated area does not contribute to excessive temperature fluctuations in surface waters.

(n) Surface Water Contaminants (Streams and Lakes): **Pathogens**

Resource Concern: Amounts of pathogens in surface waters exceed accepted standards. Contaminants may include bacteria, virus, protozans, helminths, and fungi. Pathogens can be transported in both fluid and particulate forms.



Criteria: Treated areas do not contribute pathogens at a level that adversely affects surface waters.

**(o) Aquatic Habitat Suitability**

Resource Concern: Water is not suitable aquatic organism habitat.

Criteria: Water is suitable habitat for the target species to grow, reproduce, and perpetuate acceptable population levels.

## Resource Quality Criteria - Air Resource

### 1. Quality

(a) Airborne Sediment and Smoke Particulates  
Causing Safety Problems: **Onsite**

Resource Concern: Airborne sediment and smoke particulates are creating potentially hazardous conditions for humans, plants, or animals within the treatment unit.

Criteria: Treated areas within the conservation treatment unit do not adversely affect human, animal, or plant safety.

(b) Airborne Sediment and Smoke Particulates  
Causing Safety Problems: **Offsite**

Resource Concern: Airborne sediment and smoke particulates are creating potentially hazardous conditions to humans, plants, or animals on land adjacent to the treatment unit.

Criteria: The conservation unit is treated as to not adversely affect human, animal, or plant safety on adjacent land.

(c) Airborne Sediment Particulates Causing  
Machinery and/or Vehicle and Structure  
Problems: **Onsite**

Resource Concern: Airborne sediment particulates are causing equipment failure, shortened vehicle life, and/or increased building deterioration within the conservation treatment unit.

Criteria: Treated areas do not adversely affect visibility or the design life of equipment and buildings within the treatment unit.

(d) Airborne Sediment Particulates Causing  
Machinery and/or Vehicle and Structure  
Problems: **Offsite**

Resource Concern: Airborne sediment particulates are causing equipment failure, shortened vehicle life, and/or increased building deterioration on land adjacent to the conservation treatment unit.

Criteria: Treated areas do not adversely affect visibility or the design life of equipment and buildings on land adjacent to the treatment unit.

(e) Airborne Sediment and Smoke Particulates  
Causing Health Problems: **Onsite**

**Resource Concern:** Airborne sediment and smoke particulates are of sufficient quantity to create health problems in humans, animals, and/or plants within the treatment unit.

**Criteria:** Treated areas do not adversely affect human, animal, or plant health within the treatment unit.

(f) Airborne Sediment and Smoke Particulates  
Causing Health Problems: **Offsite**

**Resource Concern:** Airborne sediment and smoke particulates are of sufficient quantity to create health problems in humans, animals, and/or plants on areas adjacent to the treatment unit. Also includes chemicals attached to soil particulates.

**Criteria:** Treated areas do not adversely affect human, animal, or plant health on areas adjacent to the treatment unit.

(g) Airborne Sediment Particulates Causing  
Conveyance Problems

**Resource Concern:** Airborne sediment and smoke particulates are interfering with the proper functioning of drainage ditches, road ditches, culverts, canals, and streams.

**Criteria:** Treated areas do not adversely affect the functioning of conveyance structures.

(h) Airborne Chemical Drift: **Onsite**

**Resource Concern:** Non-target plants and animals within the treatment unit are being adversely affected by airborne and above land surface applied pesticides.

**Criteria:** The method of chemical application is consistent with label instructions and does not adversely affect humans and/or nontarget plants, animals.

(i) Airborne Chemical Drift: **Offsite**

**Resource Concern:** Non-target plants and animals on areas adjacent to the treatment unit are being adversely affected by airborne and above land surface applied pesticides.

**Criteria:** The method of chemical application is consistent with label instructions and does not adversely affect humans and/or nontarget plants, animals, or sensitive water bodies on areas adjacent to the treatment unit.

**(j) Airborne Odors**

*Resource Concern:* Objectionable odors from such sources as confined livestock, animal waste, waste storage areas, waste lagoons, and field application of animal waste and other organics are present.

*Criteria:* Airborne odors are minimized.

**(c) Humidity**

*Resource Concern:* Improper level of humidity for flora and fauna health.

*Criteria:* Human activities affecting improper humidity are minimized or eliminated.

**2. Condition**

**(a) Air Temperature**

*Resource Concern:* Improper air temperature for development of flora and fauna. Zone of influence is from ground level to 10 times plant height.

*Criteria:* Human activities causing improper air temperature are minimized or eliminated.

**(b) Air Movement**

*Resource Concern:* Improper air movement for flora and fauna. Zone of influence is from ground level to 10 times plant height.

*Criteria:* Human activities causing improper air movement are minimized or eliminated.

## Resource Quality Criteria - Plant Resource

### 1. Suitability

#### (a) Plants are not well adapted to site

Resource Concern: Plants are not adapted to soil and climatic considerations of the area. A better adapted species or a modification of the site conditions may be needed to provide an environment suitable for the desired plants.

Criteria: Plants used in the conservation treatment unit are adapted to soil and climatic conditions, or the site is adequately modified.

#### (b) Plants are unsuitable for intended use

Resource Concern: Plants do not meet the needs and objectives of the manager, such as by providing the quantity and quality of desired food or forage, controlling erosion, improving soil condition, conserving water, adding beauty, providing habitat for animals, and increasing crop or timber production. Changes in plants may be needed.

Criteria: Plant(s) selected or being managed are suitable for the intended use.

### 2. Condition

#### (a) Productivity (Kinds, Amounts, & Distribution): Cropland

Resource Concern: Plants do not provide the quantity and quality of crops in the amount and timeliness of production needed.

Criteria: Crop yield is 75% or more of the yield potential for the soil map unit based on the FOTG, Section II.

#### (b) Productivity (Kinds, Amounts, & Distribution): Hayland and Pastureland

Resource Concern: Plants do not provide the quantity and quality of hay and/or pasture in the amount and timeliness of production needed.

Criteria: Production equals or exceeds 75% of the potential for the subject soil suitability grouping in FOTG, Section II.

#### (c) Productivity (Kinds, Amounts, & Distribution): Rangeland

Resource Concern: Plants do not provide the quantity and quality of range forage in the amount and timeliness of production needed.

**Criteria:** Productivity of desirable or key species is increasing and condition is in an upward trend for range sites in poor or fair condition. Range site trends are upward or at least static for range sites in good or excellent condition within the conservation treatment unit.

**(d) Productivity (Kinds, Amounts, & Distribution):  
Seeded Rangeland**

**Resource Concern:** Plants do not provide the quantity and quality of range forage in the amount and timeliness of production needed.

**Criteria:** Productivity of seeded species is 75% or more of the soil potential based on the FOTG, Section II, and the key management species constitute at least 75% of the total production.

**(e) Productivity (Kinds, Amounts, & Distribution):  
Annual Rangeland**

**Resource Concern:** Plants do not provide the quantity and quality of range forage in the amount and timeliness of production needed.

**Criteria:** Adequate plant residue is left on the soil surface at the end of the grazing season to protect the soil resource and productivity of seeded species is 75% or more of the soil potential based on the FOTG, Section II.

**(f) Productivity (Kinds, Amounts, & Distribution):  
Forestland**

**Resource Concern:** Plants do not provide the quantity and quality of timber in the amount and timeliness of production needed.

**Criteria:** Stand is at least 75% of the appropriate standard stocking guide recommended for the forest type and/or woodland suitability group based on the FOTG, Section II.

**(g) Productivity (Kinds, Amounts, & Distribution):  
Other Land (Wildlife, Recreation, etc.)**

**Resource Concern:** Plants do not provide the quantity and quality of cover and habitat in the amount and timeliness of production needed.

**Criteria:** Adapted or native plants are in sufficient quantity and quality to improve or protect the defined resource.

**(h) Health and Vigor**

**Resource Concern:** Plants do not manufacture sufficient plant food to continue the normal growth cycle or adequate reproduction.

**Criteria:** Plants do not show evidence of abnormal stress due to lack of management.

**(i) Plant Damage by Wind Erosion**

*Resource Concern:* Plants are damaged or destroyed as a result of excessive wind and soil particle movement, resulting in degradation of the intended or desired plant community.

*Criteria:* Plant damage by wind erosion does not result in significant yield or stand reductions.

*Criteria:* Nutrient management is consistent with the needs of the desired plants, KSU Cooperative Extension Service recommendations, and the FOTG.

**(c) Pests (Brush, Weeds, Insects, Diseases, and Fungi)**

*Resource Concern:* Pests are not managed to meet the needs of the target plant and the manager's objectives and resource management objectives.

*Criteria:* Pests are managed within acceptable levels to achieve the desired production without having adverse effects on other resources.

**3. Management**

**(a) Establishment, Growth, and Harvest**

*Resource Concern:* Management of plants does not provide the proper techniques and timing to meet the plant needs of establishment, growth, and harvest.

*Criteria:* Establishment, seeding dates, seedbed preparation for selected species, planting, fertility, and weed control are consistent with the FOTG and KSU Cooperative Extension Service recommendations. Growing plants manufacture sufficient plant food to complete their growth cycle, including natural regeneration where applicable and are harvested in a timely manner to sustain production.

**(b) Nutrient Management**

*Resource Concern:* The correct amount of plant nutrients are not available to meet plant needs.

## Resource Quality Criteria - Animal Resource

### 1. Habitat

#### (a) Food: Domestic Animals

Resource Concern: Quantity and quality of food provided do not meet the daily needs of the livestock.

Criteria: Quantity and quality of food is adequate to meet the nutritional and performance requirements of the livestock.

#### (b) Cover or Shelter: Domestic Animals

Resource Concern: Livestock are not provided adequate shelter for protection.

Criteria: Cover and shelter are adequate to protect livestock from inclement weather.

#### (c) Quantity and Quality of Drinking Water: Domestic Animals

Resource Concern: Adequate quantities and/or quality of water are not provided to meet daily needs of the livestock.

Criteria: Water supply is adequate, of sufficient quality, and is properly distributed to meet daily needs.

#### (d) Food: Wildlife

Resource Concern: Quantity and quality of food are not provided to meet the seasonal needs for the target species.

Criteria: A minimum of 30% of the habitat potential for the target species is achieved regardless of land use, based on approved habitat evaluation procedures.

#### (e) Cover or Shelter: Wildlife

Resource Concern: Adequate wildlife cover for the target species is not provided.

Criteria: A minimum of 30% of the habitat potential for the target species is achieved regardless of land use, based on approved habitat evaluation procedures.

#### (f) Quantity and Quality of Drinking Water: Wildlife

Resource Concern: Adequate quantities and/or quality of water are not provided that meet the daily needs for the target species.

Criteria: Water supply is adequate, of sufficient quality, and is properly distributed to meet daily needs.



## **2. Management**

### **(a) Population / Resource Balance**

*Resource Concern:* Numbers and kinds of domestic animals and wildlife are not in balance with space and habitat requirements.

*Criteria:* Numbers and kinds of domestic and wild animals do not exceed the carrying capacity of the land.

### **(b) Animal Health**

*Resource Concern:* Proper attention is not given to the health of the target animal. This includes such considerations as disease, parasites, and insects.

*Criteria:* Effects of poisonous plants, disease, parasites, and insects are reduced to acceptable levels.